

A method for the return of blood from a blood treatment apparatus and an apparatus to carry out the method

### **Claims**

1. A method for the return of blood from a blood treatment apparatus comprising a blood treatment element, preferably a dialysis apparatus having a dialyzer, two lines with outlets, a blood pump, a first valve arranged in the first line, a second valve arranged in the second line and a predilution port for the feeding of substitute fluid, with a substitute supply line which is connected to the predilution port and into which a substitute pump is interposed,

**characterized by the following steps:**

- the first valve in the first line is opened and the second valve arranged in the second line is closed;
- the blood pump is set to feedthrough or it is also running while the substitute pump displaces the blood by means of transported substitute fluid;
- the blood is further displaced in a volume-controlled manner until it has reached the line outlet of the first line;

- the blood pump is closed or stopped, the first valve is closed and the second valve is opened;
  - the substitute pump displaces blood through the released second line and the blood treatment element by transported substitute fluid; and
  - the blood is further displaced in a volume-controlled manner until it has reached the line outlet of the second line.
2. A method for the return of blood from a blood treatment apparatus comprising a blood treatment element, preferably a dialysis apparatus having a dialyzer, two lines with outlets, a blood pump, a first valve arranged in the first line, a second valve arranged in the second line and a postdilution port for the feeding of substitute fluid, with a substitute supply line which is connected to the postdilution port and into which a substitute pump is interposed,

**characterized by the following steps:**

- the first valve in the first line is opened and the second valve arranged in the second line is closed;
- the blood pump is set to feedthrough or it is also running while the substitute pump displaces the blood through the blood treatment element and the first line by means of transported substitute fluid;
- the blood is further displaced in a volume-controlled manner until it has reached the line outlet of the first line;
- the blood pump is closed or stopped, the first valve is closed and the second valve is opened;
- the substitute pump displaces blood through the released second line by transported substitute fluid; and
- the blood is further displaced in a volume-controlled manner until it has reached the line outlet of the second line.

3. A method in accordance with either of claims 1 or 2, wherein a highly precisely dispensing membrane pump is used as the substitute pump.
4. A method in accordance with any one of the preceding claims, wherein the blood treatment element is a dialyzer in hemodiafiltration.
5. A method in accordance with any one of the preceding claims, wherein the blood treatment element is a hemofilter in hemodiafiltration.
6. A method in accordance with any one of the preceding claims, wherein it is detected via detectors that substitute fluid is flowing back instead of blood.
7. A method in accordance with claim 6, wherein optical detectors are used.
8. A method in accordance with any one of the preceding claims, wherein the blood is largely pressed out of the blood pump.
9. An apparatus for carrying out a method in accordance with any one of the preceding claims, characterized by a blood treatment element (12), a blood pump (14), a substitute pump (16), a first line (18) as an arterial blood line, a second line (20) as a venous blood line, valves (22, 24) and a control apparatus.
10. An apparatus in accordance with claim 10, wherein detectors (26, 28), preferably optical detectors, are arranged in the lines (18, 20).
11. Apparatus in accordance with either of claims 10 or 11, wherein the pumps (14, 16) are made as double pumps connected in parallel.